AERONAUTICAL CHARTING FORUM
Instrument procedures Group
April 29-30, 2002
HISTORY RECORD

FAA Control # 02-01-240

Subject: ICAO Holding Pattern Safety Issue

Background/Discussion: This FAA-sponsored forum has previously taken the initiative to attempt to get ICAO to change its concepts for SIAP naming convention and to get world-wide standardization of the naming convention. The January 28, 2002, tragic CFIT crash of an Ecuadorian B-727-100 while flying a holding pattern associated with the NDB instrument approach procedure at the Tulcan, Ecuador Airport (ICAO ID: SETU) reveals serious deficiencies in both the application of holding pattern criteria by some ICAO-member states, and the manner in which critical procedural data notes lack standardization, both as to verbiage and charting placement. The human-factors implications all aspects of the procedural construction and charting results at Tulcan are abysmal.

Apparently, the designer of the Tulcan NDB IAP elected to constrain the holding pattern to 180 knots, with a minimum holding altitude of 14,000 feet. In the United States, such a pattern would have to be the standard 230-knot pattern to be authorized for jet airplanes. These United States criteria are based on valid aerodynamic premises. It appears that PANS-OPS terminal instrument criteria are open to more conjecture, at least as to holding pattern design, than are U.S. TERPs. It is apparent, though, that the standard application of PANS-OPS criteria would have dictated a 240-knot pattern at Tulcan above 14,000 feet, and a 230-knot pattern at 14,000 feet.

On the attached pages are a generic graphical representation of the Tulcan NDB IAP as it appeared on the date of the accident, as well as graphics of the topography for the area with placement of TERPS 230 and 175-knot holding templates for 14,000 feet. Note that the only reference to a speed limit is in the profile view of the approach chart, which most pilots would associate with the base leg outbound as shown in the profile view. Note also there is no minimum holding altitude shown in the plan view.

Recommendation: That this forum initiate the necessary actions to cause the United States representatives to ICAO to modify PANS-OPS holding pattern criteria and associated procedural text to: 1. Deny construction of holding patterns for jet airplanes with speeds less than standard, for altitudes above 10,000 feet. For altitudes 10,000 feet, and below, and where an operational requirement exists, deny a speed reduction for jet airplanes of less than 200 knots. Where a unique requirement exists for lower speeds, such IAPs should not be issued to the public; rather they should be similar to our “specials” and issued only to carriers with a demonstrated need and proven qualifications. 2. That PANS-OPS be clarified to require any non-standard holding speed limit to be associated directly with the holding pattern’s plan view icon (and in the profile view as well where an affected holding pattern is charted in the profile view. 3. That PANS-OPS be clarified to require the charting of the minimum holding altitude in a clear and unmistakable manner adjacent to the holding pattern icon.

Comments: None.

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Date: April 1, 2002

TULCAN Approach 123.2

TULCAN Tower 122.0

Alt Set: hPa
Rwy Elev: 308 hPa

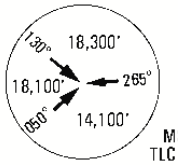
Trans Level: FL 180
Trans alt: 18000' (8321')

TULCAN, ECUADOR

EL ROSAL - TCRNEL MANTILLA

CAT B & C **NDB Rwy 23**

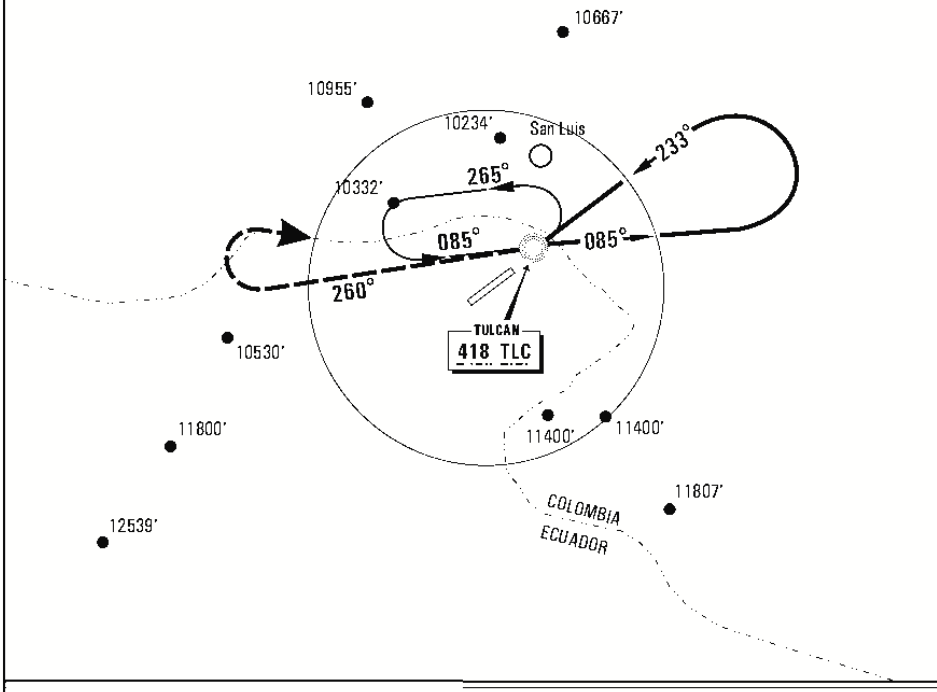
NDB 418 TLC



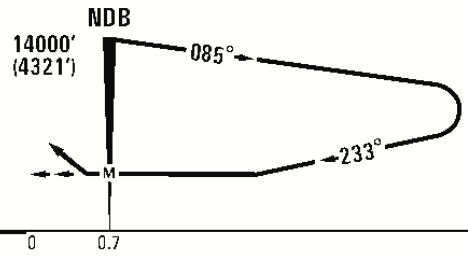
MSA
TLC NDB

Airport Elevation 9679'

NOT FOR NAVIGATION



Maximum IAS 180 kts



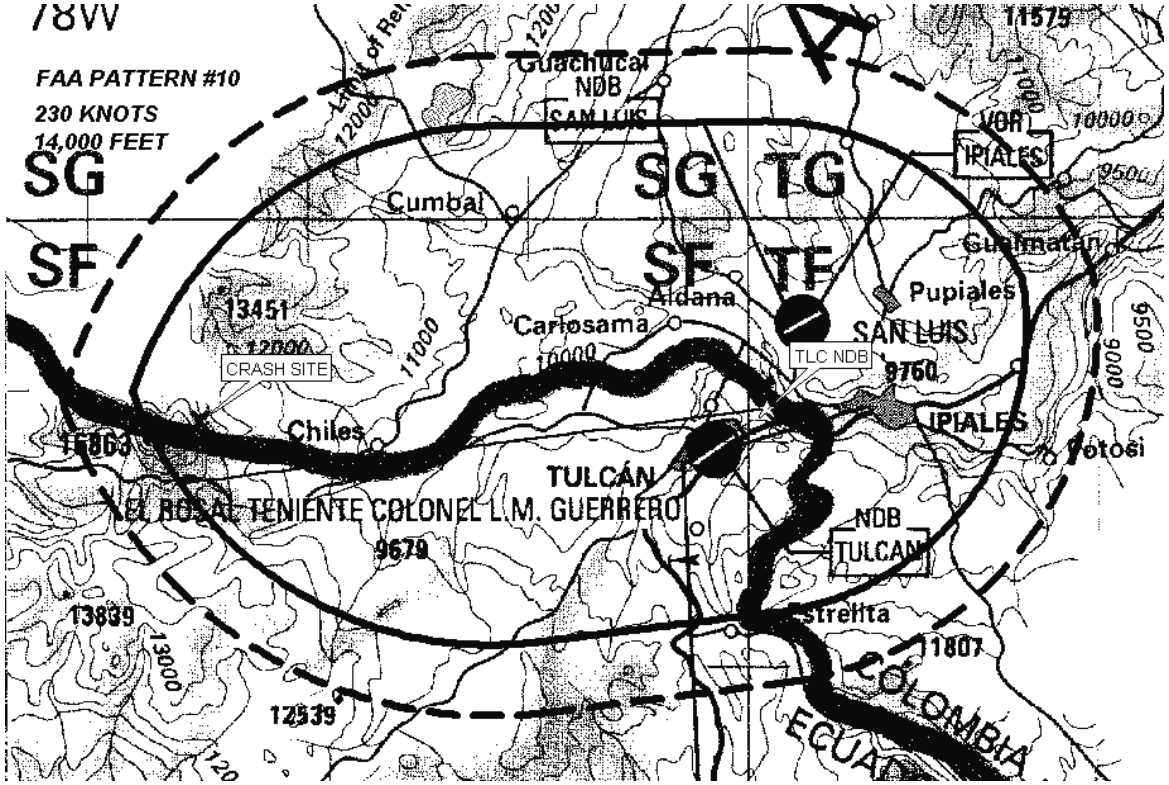
Start turn at
1.5 minutes
(6 NM)
12000' (2321')
to
11500' (1821')

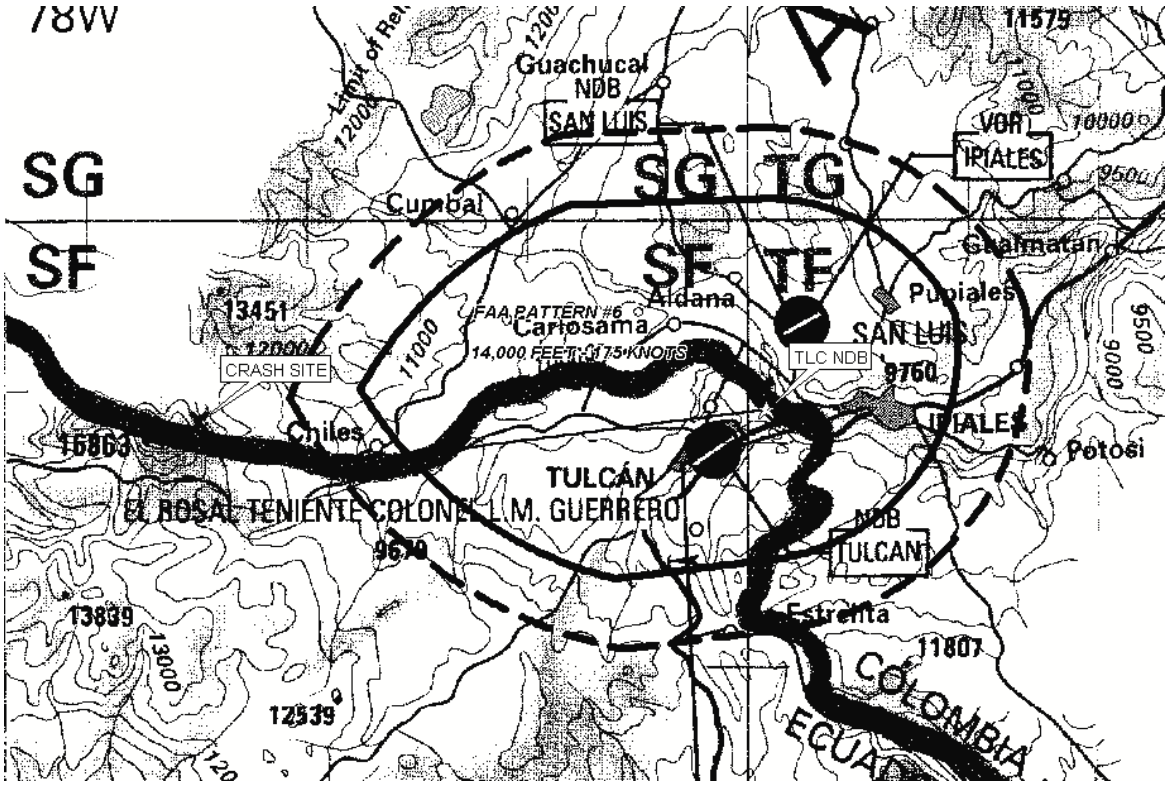
Runway 23 9679'

Airport 9679'

MISSED APPROACH: Climb on 260° bearing from TLC NDB until reaching 11500' or above, turn RIGHT and join holding pattern.

STRAIGHT-IN LANDING RUNWAY 23			CIRCLE-TO-LAND RUNWAY 05 Not Authorized South			
	MDA(H) 10600' (921') DAY	NIGHT	Max Knots	MDA (H) DAY	NIGHT
A	NA	NA	100	NA	NA
B	6.0 km		135	10900' (1221')- 6.0 km	
C			180		
D	NA		D	NA	


FAA PATTERN #10
230 KNOTS
14,000 FEET
SG
SF
SG
TG
SF
TF
Guachucal
NDB
SAN LUIS
VOR
IPIALES
Cumbal
Aldana
Carlosama
Pupiales
Guaitarilla
SAN LUIS
TLC NDB
9760
IPIALES
Potosi
Chiles
CRASH SITE
13451
16863
TULCÁN
EL ROSAL TENIENTE COLONEL L.M. GUERRERO
9679
NDB
TULCAN
Estrella
11807
13839
12539
COLOMBIA
ECUA
11575
10000
9500
9000
11000
13000


SG
SF
SG
TG
SF
TF
Guachucal
NDB
SAN LUIS
VOR
IPIALES
Cumbal
Aldana
Carlosama
FAA PATTERN #6
14,000 FEET 175 KNOTS
Pupiales
Guaitarilla
SAN LUIS
TLC NDB
9760
IPIALES
Potosi
Chiles
CRASH SITE
13451
16863
TULCÁN
EL ROSAL TENIENTE COLONEL L.M. GUERRERO
9679
NDB
TULCAN
Estrella
11807
13839
12539
COLOMBIA
ECUA
11575
10000
9500
9000
11000
13000

INITIAL DISCUSSION (Meeting 02-01): New issue presented by Wally Roberts, ALPA. ALPA believes that a January CFIT aircraft accident in Tulcan, Ecuador indicates deficiencies in both the application of holding pattern criteria and standardization of procedural data notes by some ICAO member states. Wally recommends that the ACF should initiate action to have the US representatives to ICAO recommend modification of Pans Ops criteria to resolve these issues. Norm LeFevre, AFS-420, briefed that this action is beyond the purview of the ACF. He recommended that ALPA forward this issue to the ICAO Operations Panel, chaired by Lyle Wink, AFS-400, with an information copy to Lynn Boniface, AFS-420, the US representative to the Obstacle Clearance Panel. Wally agreed to do so. No further action required of the ACF. ISSUE CLOSED.
